THE IMPACT OF ASTHMA KNOWLEDGE AND EDUCATION ON PATIENT AND PHYSICIAN PERCEPTION OF ONCE DAILY ICS

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Introduction: Much of the mortality and morbidity caused by asthma is preventable with greater treatment compliance. Inhaled corticosteroids (ICS) are the mainstay of asthma treatment, but they are under-prescribed, and their real-world effectiveness is compromised by low patient compliance. Both patient education and lower frequency of daily ICS administration improve asthma treatment compliance. This study examined the relationships between the knowledge of asthma and its treatment held by physicians and patients, and their perception of the value of 1x-daily ICS in improving compliance. **Methodology:** We conducted a mail/fax/telephone survey of a stratified random sample of 250 Canadian primary care physicians, and a telephone survey of 224 Canadian asthma patients currently using ICS. **Results:** Most physicians (68.8%) expected that patient compliance would improve considerably with 1x-daily ICS. This expectation was significantly correlated with familiarity with asthma treatment guidelines ($r = 0.20$, $p < 0.05$); and the emphasis placed on educating patients about symptom management ($r = 0.22$, $p < 0.05$), treatment compliance ($r = 0.27$, $p < 0.01$), and the use of written action plans ($r = 0.25$, $p < 0.01$). A stepwise multiple regression showed that, of these 4 predictors, expected compliance improvement with a 1x-daily ICS was best predicted by how strongly the physicians educate patients about asthma treatment compliance ($F_{(1,112)} = 7.96$, $p < 0.05$). Among the patients, 86.5% stated a preference for a 1x-daily ICS, and 66.2% felt that they would be more compliant with this formulation. Fewer than 60% reported currently using their ICS correctly, and only 4.9% of patients completely understood the mode of action of their ICS. Current ICS compliance was significantly correlated with knowledge of use and mode of action of ICS ($r = 0.32$, $p < 0.01$). **Discussion:** These results indicate that physicians who are most likely to recognize the compliance advantages of 1x-daily ICS for patients also feel most knowledgeable, and place the most emphasis on educating patients. This corresponds well to patients, who prefer 1x-daily ICS, and among whom the most knowledgeable are also the most compliant with their asthma medication. Both improved education and 1x-daily ICS therapy can be expected to improve compliance and reduce asthma morbidity and mortality.

Keywords: Asthma, Inhaled-Corticosteroids, Compliance

Introduction

- Compliance with ICS is poor and hinders effective asthma patient management [1-21].
- Research in other chronic illnesses has shown that once-daily formulations improve compliance and therapeutic coverage [22-34].
- The simplification of medication regimens, combined with asthma education, may increase patient compliance with asthma treatment [35, 36], and improve the quality of life of asthmatics [37].
- van der Palen et al. (1997) [19] found that pre-education compliance with ICS medication was 83%, with treatment compliance increasing to 92% after an extensive education program.
- The rate of noncompliance in patients with allergic rhinitis and asthma is highest for subjects uneducated in the treatment of their disease [38].
- Poor compliance with asthma therapy may also be attributable to a deficit in patient knowledge of the disease process and mode of action of therapy [39, 40]. Sufficient patient knowledge is required to maintain the motivation necessary for continued treatment compliance [40, 41].
- **The goal of this study was to examine the relationship between patient and physicians' knowledge of asthma and its treatment, and the perception of the potential of once-daily ICSs to improve compliance.**

Methodology

Physicians: a representative mail/fax/telephone survey of a stratified random sample of 250 Canadian primary care physicians

Patients: a telephone survey of 224 Canadian patients with asthma and currently using ICS therapy

Results

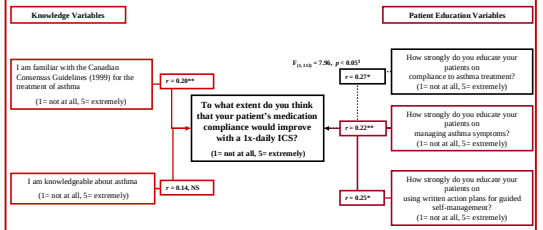
i) Physician Survey

- Of the 250 physicians randomly selected from a database of all Canadian general practitioners and family physicians (N = 26,714), 183 met the inclusion criteria for this study.
- The final sample of 127 physicians represents a 69% response rate among those who were eligible.
- The physicians' province of practice, their language, and their gender distribution were adequately representative of Canadian physicians [42].
- On average, physicians estimated that 56.8% of their patients currently took their inhaled ICS as prescribed, but that 76.3% would be compliant with a once-daily ICS.
- Most physicians (68.8%) felt that patient compliance would improve considerably with a once-daily ICS. Further, 86.8% of physicians felt that more patients would be compliant with a once-daily ICS compared to their current, two or more doses per day therapy.
- Physicians' expectation of patient compliance improvement with once daily ICS therapy was positively correlated with their self-assessed familiarity with asthma treatment guidelines ($r = 0.20$, $p < 0.05$); and with the extent to which they educate patients on: symptom management ($r = 0.22$, $p < 0.05$), treatment compliance ($r = 0.27$, $p < 0.01$), and the use of written action plans ($r = 0.25$, $p < 0.01$; Figure 1).
- Stepwise multiple regression showed that of these 4 predictors, expected compliance improvement with a once-daily ICS was best predicted by how strongly physicians educate patients about asthma treatment compliance ($F_{(1,112)} = 7.96$, $p < 0.05$; Figure 1).

ii) Patient Survey

- The distribution by province, age and gender of the patient sample were similar to that of Canadian asthmatics in general (60% females) [3, 43-46]. Therefore, the results of the survey are generalizable to Canadian asthmatics.
- Only 47.7% of patients reported taking their current ICS exactly as prescribed every day of the month.
- A once-daily dose formulation was preferred by 86.5% of the patients, versus 13.4% who preferred two or more daily doses.
- 66.2% of patients responded that they would be more likely to take their medication as prescribed if it was a once per day dosing regimen.
- Only 4.9% demonstrated a correct understanding of the mode of action of ICS therapy and 58.5% reported correctly using their ICS.
- Knowledge of use and mode of action of ICS therapy was significantly correlated to current compliance ($r = 0.32$, $p < 0.01$).
- More specifically, current compliance was positively correlated to patients' understanding that ICSs should not be used to relieve asthma attacks, of the need to take ICSs regularly to help control asthma, and of the fact that ICS therapy works by reducing inflammation/ swelling of the airways ($F_{(3,216)} = 34.81$, $p < 0.001$; see Figure 2).
- Patients with a poor understanding of the importance of using ICSs everyday to help control asthma were more likely to feel that a once daily ICS would help them be more compliant ($r = -0.16$; Figure 3).

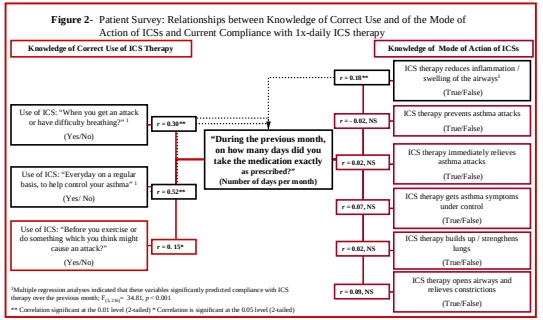
Figure 1- Physician Survey: Relationships between Knowledge and Patient Education Variables and Expected Compliance Improvement with 1x-daily ICS therapy



[1] Stepwise multiple regression analyses indicated that expected compliance improvement with a 1x-daily ICS was predicted by how strongly physicians educated patients about asthma treatment compliance.

* Correlation significant at the 0.01 level (2-tailed), ** Correlation significant at the 0.05 level (2-tailed)

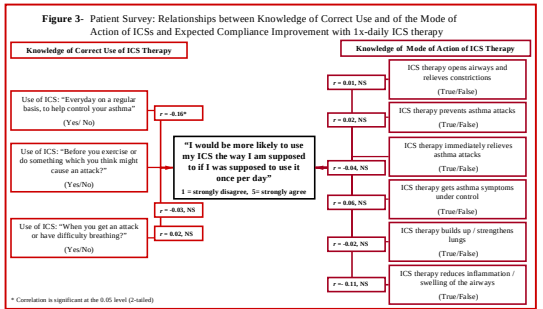
Figure 2- Patient Survey: Relationships between Knowledge of Correct Use and of the Mode of Action of ICSs and Current Compliance with 1x-daily ICS therapy



[1]Multiple regression analyses indicated that these variables significantly predicted compliance with ICS therapy over the previous month; $F_{(3,216)} = 34.81$, $p < 0.001$

** Correlation significant at the 0.01 level (2-tailed) * Correlation is significant at the 0.05 level (2-tailed)

Figure 3- Patient Survey: Relationships between Knowledge of Correct Use and of the Mode of Action of ICSs and Expected Compliance Improvement with 1x-daily ICS therapy



* Correlation is significant at the 0.05 level (2-tailed)

Conclusions

Current Compliance to ICS Therapy

- Physicians estimated that slightly more than half of their patients were compliant with their current ICS therapy.
- In patients, better knowledge of the correct use of ICS therapy and of ICS mode of action was related to higher compliance.
- Educating patients on the correct use of ICS and on ICSs' mode of action may be a significant aid to efforts to improve asthma patients' compliance.

Expected Compliance Improvement with Once-Daily ICS Therapy

- Physicians estimated that once daily ICS therapy would significantly improve patient compliance.
- Physicians who actively educate their patients on asthma treatment compliance predicted the most compliance improvement with once daily ICS.
- Patients expected to be more compliant with once daily ICS therapy than with their current twice or more daily dosage.
- Patients with lower knowledge of the correct use of ICS therapy were more likely to feel that their compliance would improve with a once daily ICS.
- More knowledgeable physicians are more likely be favourable towards prescribing once daily ICS therapy.
- Physicians who place more emphasis on educating their patients about asthma treatment and who feel more knowledgeable about asthma treatment expect higher patient compliance improvement with once daily ICS therapy.
- Overall, better knowledge in patients leads to better current compliance
- Consistently, patients with poor knowledge expect greater compliance improvement with once daily ICS therapy.
- While once daily ICS therapy has the potential of improving all patients' compliance, this may be particularly so for patients with poor asthma therapy knowledge.

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